Chapter 7 : Radio and Television Cueing

At AFRTS-BC

Cueing for American Forces Radio and Television Service (AFRTS) Radio and TV is accomplished using a Wegener cueing system designed to originate radio and TV cues using a Binary Coded Decimal (BCD) configuration. A four contact closure BCD system is used to produce a maximum of 15 cues on the Decoder side.

For the purpose of identifying only, programs are placed into the following categories: normal and live or quick turn-around.

Normal Programming:

Normal programming includes programs that the BC has on hand long enough to completely process (more than 72 hours). Entertainment programs, soaps, and non-time-sensitive specials fit into this category.

Part of the processing is slugging and entering times for playback. Accurate times are then included in the STB (Regional and Local breaks) file for normal programming. Program times (actually the segment duration's only) are retrieved from the database and entered into the traffic management program database.

Once entered into traffic management program, the times become a permanent part of the program record. Approximately 5 days prior to airdate, a file is exported from traffic management program that includes program information for each AFN network and airdate. The file includes title, subtitle, house #, and times for programs scheduled to air on that date. This file is imported into a traffic program. Once the information is loaded, the command information availabilities are adjusted to fill in the time slots.

Finally, an STB file is created and placed on the FTP for downloading at affiliate locations. Frequently, times are not available 5 days out, but are available more than 72 hours prior to air-date. In these cases, the traffic log is updated and a new STB file is posted reflecting the update.

Live and Quick Turn-Around Programming:

Not all programs are available to be processed in advance, such as most sporting events. Live and quick turn-around programming is programming that the BC airs within 72 hours of acquisition. News, sports, late shows, most specials and other programs that are time sensitive are included in this category. In most cases these times are not available to the BC in advance; consequently, the times in the STB file are not accurate for these programs.

Cueing within the BAS is controlled by four separate relays that are activated by command lines imbedded in the program playlist. These four relay commands are combined together in the Wegener tone encoder to generate a total of 15 individual cues. Each cue is attached to an event in the play list and can be programmed to activate before or during the event. Cues for TV are attached to

the beginning of an event and are transmitted 21 frames in advance of the scheduled event.

The Wegener Tone Decoder requires 14 frames to detect a cue with an additional 7 frames added for startup time of automation equipment. Also, there are several different variables that can affect their accuracy to within +/- 2 frames. This isn't a problem as long as there is enough black on each end of the spot and the spot itself is timed correctly.

The AFRTS standard is a minimum of 15 frames of black at the beginning and end of each spot to ensure a clean cut from one event to the next. This wasn't a problem when the entire spot break was covered by AFRTS. Although AFRTS does fill the available spot interval, affiliates are sharing some of the allotted time and expect to return to the network during a fade up from black. This demands frame accurate timing and can only be accomplished if each player has correctly formatted their spots with the appropriate amount of black.

All cues for TV are scheduled and initiated electronically with the exception of the "Return to Net" cue. This cue should be connected at all locations to bring locations back to Net for varying reasons. See table 6-1 for a listing of television service cue assignments. The majority of the time this cue is employed to bring affiliates back to net during live events with unknown spot intervals. Otherwise, if the affiliate is in the middle of a spot break and the event returns to normal programming the length remaining in the spot break is missed.

Cueing for radio is also timed to frame accuracy but times aren't as critical as for TV. For this reason radio cues are not transmitted in advance of the scheduled event. Cues for radio are scheduled in a daily template/play list and require very little interaction to keep current with program material. Cues are originated for radio within the AudioVault play list and are timed to real timecode. Cues for radio use the same principle of BCD function of four separate relays to produce 15 distinct cues. See table 6-2 for a listing of radio service cue function assignments. The AudioVault database is capable of storing individual command lines for each cue assignment. Each cue is assigned an individual command line and shows up in the play list as a single event.

Encoder Installation and Operation

Cueing for American Forces Radio and Television Service (AFRTS) Radio and TV is accomplished using the Wegener 1601 mainframe equipped with the appropriate electronic package. At the Encoder the Wegener Communications Model 1698 Tone Encoder unit is used to originate radio and TV cues, using a Binary Coded Decimal (BCD) configuration. A four contact closure BCD system is used to produce a maximum of 15 cues on the Decoder side. The inputs required for various output tone combinations are listed in table 6-3.

Table 7-1 TV Services Cue Function Assignments	
Cue	**Function**
1	STB (regional brake)
2	LCL (local affiliate break)
5	Return to network
6	Advisory start
8	Shared ID
9	Soft Start Cue (arming window disenable)
A	Soft End Cue (arming window enable)
C	VCR Wakeup (5 second warning of cue 2)

Cue “9” puts an AVID into the event stack mode; a cue “A” puts the AVID back into the timed playlist mode.

Table 7-2 Radio Service Cue Function Assignments	
Cue	**Function**
1	Start of breakaway
2	Top of hour
3	Sixty second breakaway
4	Linear five second ID
5	Seven second ID
6	Nine second ID
8	End of message / stop
9	Legal ID (top of hour)
A	Forced recall
B	End of forced B recall
C	Ballgame spots
D	Extended breakaway
E	End of ballgame

Table 7-3 BCD Function				
Seven Segment Display	**1** **25 Hz Left**	**2** **25 Hz Right**	**4** **35 Hz Left**	**8** **35 Hz Right**
1	X	---	---	---
2	---	X	---	---
3	X	X	---	---
4	---	---	X	---
5	X	---	X	---
6	---	X	X	---
7	X	X	X	---
8	---	---	---	X
9	X		---	X
A	---	X	---	X
B	X	X	---	X
C	---	---	X	X
D	X	---	X	X
E	---	X	---	X
F	X	X	X	X

The tone encoder is used to add cue tones to program audio for transmission over satellite and local transmission systems. This enables AFRTS-BC to provide network controlled automated commercial insertions at affiliate locations. The duration of the output tone(s) is controlled by an enabling input. AFRTS presently uses Alamar to control cue duration.

All circuits of a Model 1698 tone encoder are contained on a single level standard 4.25 by 12-inch printed single board. Any unit module will occupy one slot position of a model 1601 mainframe, a model 2601, or model 1602 mainframe. The difference between a model 1601 and model 2601 mainframe is the type of back plane interface connectors used; otherwise they are nearly identical.

The Model 1698 tone encoder receives stereo audio inputs from an external source and inserts tones on the two channels. This unit can provide 15 different tone output combinations by inserting selected 25 Hz and/or 35 Hz tones on the right, left or both audio channels (Table 6-3). The tone output selection is controlled using four BCD logic inputs.

The audio level of each channel can be adjusted through front panel controls LEFT R67, RIGHT R61 (figure 6-1). The adjustments are the same as a Decoder. There is a control on the front panel to adjust the duration of selected tones, R134. The tones can be jumper selected (jumper J9) to either be present only while the BCD inputs are active, or be continuous for a duration from approximately 0.5 second to 5.5 seconds after the BCD inputs are removed. The front panel also provides a green indicator that lights when tones are being generated and a seven-segment display for visual identification of the selected tone combination. Test points on the front panel provide for monitoring of channel function during normal operation.

Note: All program audio below 50Hz is stripped to allow for inserting cues tones, by the Wegener encoder. Therefore, processing of audio below 50 Hz. Is not productive and may increase the risk of unwanted cues tones in programming. Also, Wegener tone encoders are set at the factory at +6dB for a single frequency cue (25 or 35 Hz.) and +9dB for multiple frequency cues (25 and 35 Hz. Combined) cue tone output. The AFRTS level is set to +4dB for single frequency cues and +6dB for multiple frequency cues. This is the absolute minimum level (+4dB / +6dB) allowable by Wegener without modification to the card for alignment cue tone levels.

Decoder Installation and Operation

Wegener 1645/46/47/48 tone decoder: The purpose of the tone decoder is to detect the presence a 25 or 35 Hz cue tone on demodulated program audio. The tones are transmitted by the network on program audio channels. Model 1645 is for 25 Hz, model 1646 is for 35 Hz detection, and model 1648 is for 25 Hz and 35 Hz detection. AFRTS has the capability of originating 15 distinct cues on all of its program audio channels with the exception of the Contingency radio service.

Figure 6-2 illustrates how tone decoders are used in typical applications. The program base band source, from a demodulated audio source, is routed through the decoder. In the process, 25 or 35 Hz detectors are used to detect the presence of either a 25 Hz, or 35 Hz tone, or in the Model 1648, 25 and 35 Hz tone combinations. Upon detection, the decoder operates on the 15 contact closures. The contact closure is used to switch external devices such as automation systems to control routing of program audio and start automation equipment for the purpose of recording and/or playing local spots. A very important part of the decoder detection process is the removal of cue tones from program audio.

Demodulated audio from the PowerVu Integrated Receiver Decoder (IRD) is wired directly to the audio input of the 1648 Wegener tone decoder for cue tone detection. The reason for inputting program audio from the IRD to the decoder is to detect cue tones and to separate audio cues from program audio. This will eliminate annoying audio cues from program audio that in some situations can and will be audible to the audience. Audio output of the decoder is unbalanced and in most applications will require converting to a balanced output. This can be accomplished by installing an unbalanced to balanced audio card. Several

manufactures supply conversions from unbalance to balanced audio modules: the Wegner 1659 is one example. Cues tones are seldom audible because of their sub-audible tone characteristics and short duration before they are masked by program audio; however, Wegner recommends stripping the tones through the use of a tone decoder.

The model 1648 tone decoder is capable of handling balanced or unbalance audio inputs. The two position jumpers located on the end of the decoder card should be strapped on the dot position for balanced and away from the dot for unbalanced audio inputs.

Ensure that the audio outputs are properly phased, that is, use the same pin from each connector to the (+) and (–) outputs. Also, maintain left and right order. By referring to table 6-1 you will see that if you cross-input a cue such as 25 Hz to the right channel instead of to the left channel you would receive a cue 2, as opposed to the intended cue 1.

To interconnect audio outputs from the Model 1648 tone decoder to external equipment, connect J7 (left channel), and J9 (right channel) to the external equipment. Outputs from the 1659 (Unbalanced to Balanced) card are 600 ohms balanced signals, pins 1 and 3 are differential balanced audio, pin 2 is chassis ground. (see figure 6-2 for level adjustments and figure 6-1 for wiring diagram).

Controls and Indicators

On the front of the decoder card is an LED activity display (figure 6-2). The display exhibits, in hexadecimal form, the numeral of the last tone transmitted. Tones 1 through 9 will be noted as numerals 1 though 9; note 10 through 15 will be indicated as letters A though F respectively. The green indicator beneath the LED display will illuminate during the transmission of any tone function. The indicator will extinguish upon termination of tone, but the led display will continue to display the last tone transmitted. Test points labeled “LEFT”; “RIGHT”, and “GROUND” are available to monitor program audio at any time. The test points are 1K Ohm unbalanced signals.

Three adjustments are available from the front panel. From top to bottom they are R32, R73, and R153. Functions are LEFT channel gain, RIGHT channel gain, and variable contact closure time. Variable or fixed duration is selectable by jumper J9, located in the middle of the card. In the fixed position the duration of the contact closure is slaved to the duration of the incoming tone. In the variable position the duration of the contact closure is adjustable by R153 from 0.5 seconds to 5.5 seconds. **CAUTION**, if a second tone is received before the end of the fixed duration time the second cue will not be recognized or decoded

1644 Relay Card

The 1644 relay card is composed of 15 relay closures that can be set to normal open or normal closed for each of the 15 independent relays. Up to five 1644 Modules may be used in a single Model 1601 Mainframe. Wegener instruction manuals are vague on how this card is connected to function properly with the

1648 tone decoder card. The 1644 relay card will not work by simply plugging it in next to a decoder card as the Wegener instruction manual will lead you to believe (see wiring diagram, figure 6-1). Connecting Figure 6-1 is a pictorial view of the rear back plane of a 1600 series Wegener mainframe. The following circuit description is taken from three Wegener manuals and is intended to simplify the process of interconnecting different modules (figure 6-1). Pins 2, 4, 6, and 8 from the 24-pin connector, are the Decoder BCD outputs needed to operate the 1644 relay card. On each side of the 24-pin connector are 4 separate three-pin connectors. These connectors are labeled to identify pins 1 and 3 for pin layout and location. The 1644 Relay card is mounted in the mainframe in a vertical position and the two 3 pin connectors looking from the back of the mainframe are the relay card inputs. Connect pin 2 of the 24-pin connector to pin 1 on the top three-pin connector (BCD 1). Connect pin 4 of the 24-pin connector to pin 3 of the top three-pin connector (BCD 2). Connect pin 6 of the 24-pin connector to pin 1 of the bottom three-pin connector (BCD 4). Connect pin 8 of the 24 pin connector to pin 3 of the bottom three pin (BCD 8).

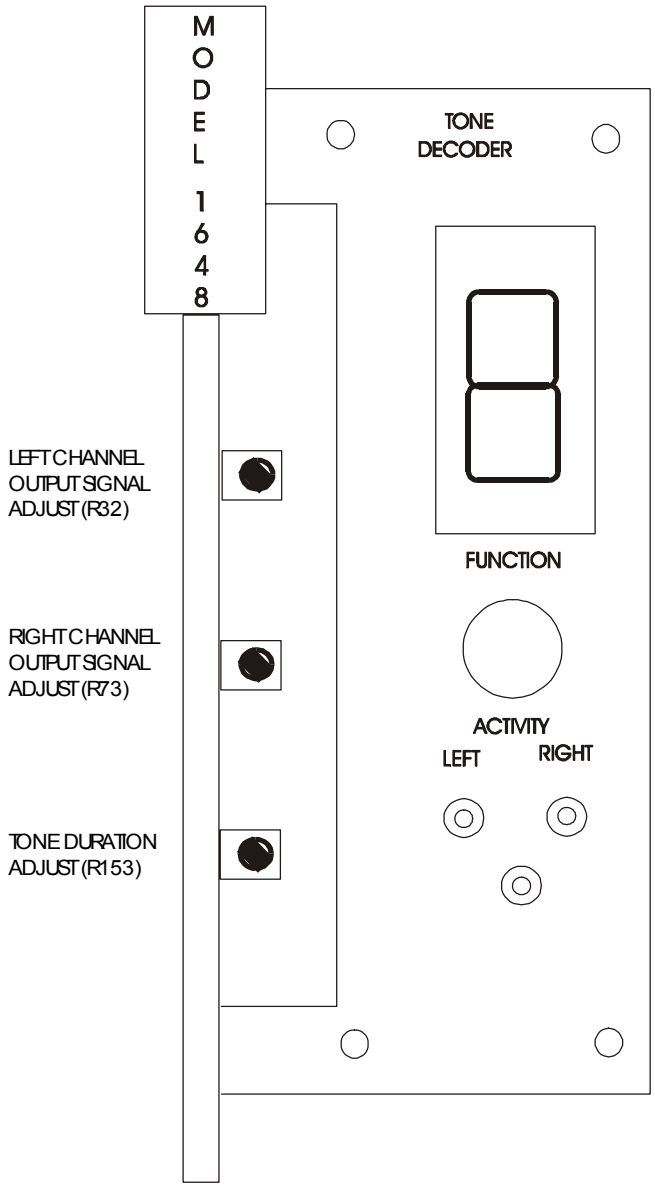

Figure 6-2: Model 1648 Tone Decoder, Front Panel Indicator and Controls